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**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
 (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 435 WO	<b>FOR FURTHER ACTION</b>	
	See Form PCT/IPEA/416	
International application No. PCT/DK2004/000241	International filing date (day/month/year) 02.04.2004	Priority date (day/month/year) 04.04.2003
International Patent Classification (IPC) or national classification and IPC A61K31/451, A61K31/4418, C07D211/22, C07D211/70, C07D407/12, A61P25/00		
Applicant H. LUNDBECK A/S et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a.  *(sent to the applicant and to the International Bureau) a total of sheets, as follows:*
    - sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b.  *(sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).*
4. This report contains indications relating to the following items:
 

<input checked="" type="checkbox"/> Box No. I Basis of the opinion
<input type="checkbox"/> Box No. II Priority
<input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input checked="" type="checkbox"/> Box No. VI Certain documents cited
<input type="checkbox"/> Box No. VII Certain defects in the international application
<input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand  24.09.2004	Date of completion of this report  25.02.2005
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 eprmu d Fax: +49 89 2399 - 4465	Authorized Officer  Telephone No. +49 89 2399-

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

### Description, Pages

1-33                          as originally filed

### Claims, Numbers

1-19                          as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

- The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
- This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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## **Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
  - the entire international application,
  - claims Nos. 18
    - because:
    - the said international application, or the said claims Nos. 18 relate to the following subject matter which does not require an international preliminary examination (specify):  
**see separate sheet**
    - the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
    - the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
    - no international search report has been established for the said claims Nos..
    - the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
      - the written form                            has not been furnished  
    does not comply with the standard
      - the computer readable form               has not been furnished  
    does not comply with the standard
- the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
- See separate sheet for further details

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-19
Industrial applicability (IA)	Yes:	Claims	1-17,19
	No:	Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**Box No. VI Certain documents cited**

**1. Certain published documents (Rule 70.10)**

**and / or**

**2. Non-written disclosures (Rule 70.9)**

**see separate sheet**

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**Re Item III**

**Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

Claim 18 relates to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims (Article 34(4)(a)(I) PCT).

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1 Prior art**

Reference is made to the following documents:

- D1: WO03029232 (P-document, see item VI)
- D2: US4241071
- D3: US4198417
- D4: J. MED. CHEM., 1979, vol. 22, no. 11, pages 1347-1354
- D5: WO0127068

**2 Novelty (Article 33(2) PCT)**

The present compounds are novel over D2-D5 in view of their O atom bridge between the 2 phenyl rings and in view of their monosubstituted piperidine ring or tetrahydropyridine ring.

**3 Inventive step (Article 33(3) PCT)**

The closest prior art is represented by D2 and D4 which disclose piperidine derivatives useful as antidepressant agents (see D2, claim 6 and D4, table I). Said compounds of D2 and D4 differ from the present compounds in view of their

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methylene bridge which in the present compounds has been replaced by a O atom.

The technical problem underlying the present application is regarded as the provision of further antidepressant agents.

**3.1 Present compounds of formula (I) having a piperidine ring**

D3 equally discloses antidepressant agents which differ from said present compounds in view of their substituent R' in position 4 of the piperidine ring (see D3, claim 1). It is noted however that the compounds of D3 have a O bridge between the 2 phenyl rings. Accordingly, said O bridge appears to be a straightforward equivalent of the methylene bridge at least for this family of antidepressant agents. Hence, said present compounds have to be considered as obvious analogs of the D2 and D4 compounds that the skilled person would have reached just by combining D2 and D4 with D3. In the absence of any unexpected effect over D2 and D4, no inventive step can be acknowledged for said present compounds.

**3.2 Present compounds of formula (I) having a tetrahydropyridine ring**

The same reasoning as above applies for the present compounds having a tetrahydropyridine ring. However, since none of the cited prior art documents teaches to replace the piperidine ring of the D2 and D4 compounds by a tetrahydropyridine ring inventive step is acknowledged for said compounds.

**4 Industrial applicability (Article 33(4) PCT)**

For the assessment of the present claim 18 on the question whether it is industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

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**Re Item VI**

**Certain documents cited**

The priority document pertaining to the present application was not available at the time of establishing this international preliminary examination report. Hence, it is based on the assumption that all claims enjoy priority rights from the filing date of the priority document. If it later turns out that this is not correct, the P-document D1 cited in the international search report could become relevant to assess whether the claims satisfy the criteria set forth in Article 33(1) PCT.